UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/777,139	02/05/2001	Gregory Hagan Moulton	UND004	5504

7590   09/09/2005

William J. Kubida, Esq.
Hogan & Hartson, LLP
1200 17th Street Suite 1500
Denver, CO 80202

EXAMINER
ZAND, KAMBIZ

ART UNIT	PAPER NUMBER
2132	

DATE MAILED: 09/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>23 August 2005</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1 and 3-36</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1 and 3-36</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.
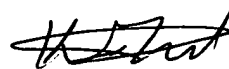
Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>05 February 2001</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1. The text of those sections of Title 35,U.S.Code not included in this section can be found in the prior office action.

2. The prior office actions are incorporated herein by reference. In particular, the observations with respect to claim language, and response to previously presented arguments.

3. Claim 3 has been cancelled.

4. Claims 1 and 28 have been amended.

5. Claims 1-36 are pending.

Response to Arguments

6. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

7. **Claims 1, 3, 4, 6-13, 17-25, 28-36** are rejected under 35 U.S.C. 102(e) as being anticipated by Burning, III et al (2002/0035667 A1).

As per claims 1, 10 and 22 Burning, III et al (2002/0035667 A1) teach a data storage system comprising: a plurality of storage nodes; data storage mechanisms implemented in each storage node; a communication medium linking storage nodes; and a data

distributed across a selected set of the storage nodes such that the data remains

available irrespective of the unavailability of one or more of the storage nodes within the

selected set (see abstract; fig.1-2 and associated text; paragraph 0013-0024 where

data remains available regardless of failure or unavailability of a storage node), wherein

the data storage mechanisms on at least two storage nodes collectively implement a

unitary volume of network storage (see paragraph 0005 and 0007).

As per claim 3 Burning, III et al (2002/0035667 A1) teach the data storage system of

claim 1 wherein the communication medium comprises: a public network for receiving

access requests for the data storage system; and a private network enabling

communication between storage nodes (see fig.2 and associated text; paragraph 0022

where the internet corresponds to applicant's public network).

As per claim 4 Burning, III et al (2002/0035667 A1) teach the data storage system of

claim 3 wherein the public network comprises the Internet (see paragraph 0022).

As per claim 6 Burning, III et al (2002/0035667 A1) teach the data storage system of

claim 1 further comprising: communication processes implemented within each of the

storage nodes operable to exchange state information between at least some of the

other data storage nodes (see paragraph 0018 and 0019).

As per claim 7 Burning, III et al (2002/0035667 A1) teach the data storage system of

claim 1 wherein each of the data storage nodes further comprises data structures

configured to store state information about one or more other nodes and the

communication links between them (see paragraph 0019 where the regeneration of the

data stored on the failing disk corresponds to applicant's stored state information).

As per claim 8 Burning, III et al (2002/0035667 A1) teach the data storage system of

claim 7 wherein the state information comprises information selected from the group

consisting of but not limited to: availability information, capacity information, quality of

service information, performance information, geographical location information,

network topological location information (see paragraph 0014 and 0018).

As per claim 9 Burning, III et al (2002/0035667 A1) teach the data storage system of

claim 8 wherein the set of storage nodes is selected by a first of the storage nodes

using the state information stored in the first of the storage nodes (see paragraph 0018

and 0019).

As per claim 11 Burning, III et al (2002/0035667 A1) teach the data storage system of

claim 1 wherein the network comprises: a plurality of first level networks, each first level

network coupling multiple storage nodes; and a second level network coupling at least

two of the first level networks (see fig.2 and associated text; paragraph 0022).

As per claim 12 Burning, III et al (2002/0035667 A1) teach the data storage system of

claim 11 wherein the first level network comprises a connection selected from the group

consisting of: Ethernet, fast Ethernet, gigabit Ethernet, Fiber channel, ATM, firewire,

Myernet, SCSI, serial, parallel, universal serial bus, and wireless networks (see

paragraph 0018 and paragraph 0022).

As per claim 13 Burning, III et al (2002/0035667 A1) teach the data storage system of

claim 1 further comprising: storage management processes executing on one of the

storage nodes to determine state information about each of the set of storage nodes

(see fig.2 and associated text).

As per claims 17, 23 and 24 Burning, III et al (2002/0035667 A1) teach a method of

managing data storage in a network comprising multiple storage nodes, the method

comprising the acts of: communicating a storage request to at least one storage node;

and causing the at least one storage node to implement the storage request using an

arbitrary subset of the storage nodes (see abstract; fig.1-2 and associated text;

paragraph 0013-0024 where data remains available regardless of failure or

unavailability of a storage node).

As per claim 18 Burning, III et al (2002/0035667 A1) teach the method of claim 17

further comprising: communicating state information between the multiple storage

nodes; and selecting the arbitrary subset of the multiple storage nodes to be used

based upon the state information (see paragraph 0018 and 0019).

As per claim 19 Burning, III et al (2002/0035667 A1) teach the method of claim 17

wherein the act of implementing the storage request comprises associating error

checking and correcting (ECC) code with storage request (see paragraph 0018 where

the failure corresponds to error checking and replacing the data from the fail disk

corresponds to correcting).

As per claim 20 Burning, III et al (2002/0035667 A1) teach the method of claim 19

wherein the ECC code is stored in a single network storage node and the unit of data is

stored in two or more network storage nodes (see paragraph 0018 and 0019).

As per claim 21 Burning, III et al (2002/0035667 A1) teach the method of claim 17

further comprising: retrieving a stored unit of data specified by the storage request; and

verifying the correctness of the stored unit of data; upon detection of an error in the

retrieved unit of data, retrieving the correct unit of data using data stored in the others of

the arbitrary subset of the multiple storage nodes (see paragraph 0018 and 0019).

As per claim 25 Burning, III et al (2002/0035667 A1) teach the method of claim 17

further comprising moving the stored unit of data from one network storage node to

another network storage node after the step of storing (see paragraph 0018; fig.2 and

associated text).

As per claim 28 Burning, III et al (2002/0035667 A1) teach a data storage system

comprising: a peer-to-peer network of three or more of storage devices, each storage

device having means for communicating state information with other storage devices, at

least one storage device comprising means for receiving storage requests from external

entities, and at least one storage device comprising means for causing read and write

operations to be performed on others of the storage devices (see abstract; fig.1-2 and

associated text; paragraph 0013-0024 where data remains available regardless of

failure or unavailability of a storage node whether external or internal entities and where

in paragraph 0018 disclose at least six storage devices).

As per claim 29 Burning, III et al (2002/0035667 A1) teach the system of claim 28

wherein each of the storage devices comprises means for causing read and write

operations to be performed on others of the storage devices (see fig.2 and associated

text).

As per claim 30 Burning, III et al (2002/0035667 A1) teach the system of claim 28

wherein each of the storage devices comprises data structures defined to configure at

least two geographically distant ones of the data storage devices as a unitary volume of

storage (see paragraph 0022 where remote corresponds to applicant's geographically

distance; fig.2 and associated text).

As per claim 31 Burning, III et al (2002/0035667 A1) teach the system of claim 30

further comprising: a network coupling to each of the data storage devices; and a

storage controller coupled to the network for logically combining the at least two data

storage devices into a single logical storage device (see paragraph 0014 and 0020).

As per claim 32 Burning, III et al (2002/0035667 A1) teach a distributed data storage

array comprising: a plurality of network connected storage nodes; a network interface

within each storage node for receiving data and control information from other storage

nodes; a network interface within at least one storage node for receiving data storage

access requests from external sources; and storage management processes within the

at least one storage node operable to distribute data storage for a logically contiguous

quantity of data across multiple storage nodes (see abstract; fig.1-2 and associated text;

paragraph 0013-0024 where data remains available regardless of failure or

unavailability of a storage node).

As per claim 33 Burning, III et al (2002/0035667 A1) teach a data storage system

implemented on top of a plurality of networked computer systems and a communication

network, wherein each of the networked computer systems implements a storage node

and comprises: a processor for processing data according to program instructions; a

network interface coupled to the processor and the network for communicating data with

external entities, including other storage nodes, across the network; memory coupled to

the processor, the memory comprising storage space configured to store data and

instructions used by the processor; one or more mass storage devices coupled to the

processor; a communication process comprising program instructions executing in the

storage node and in communication with the network interface to provide an interface to

communicate data storage access requests and responses with the external entities;

storage management processes comprising program instructions executing in the

storage node and responsive to the received data storage access requests and in

communication with the network interface to distribute and coordinate data storage

operations with external storage nodes (see abstract; fig.1-2 and associated text;

paragraph 0013-0024 where data remains available regardless of failure or

unavailability of a storage node).

As per claim 34 Burning, III et al (2002/0035667 A1) teach the system of claim 33

wherein the storage management processes include processes that communicate with

the external storage nodes to provide fault-tolerant distribution of data across the a

plurality of storage (see paragraph 0018 and 0019;abstract; paragraph 0022).

As per claim 35 Burning, III et al (2002/0035667 A1) teach the system of claim 33

wherein the storage management processes include processes for distributing data

redundantly to protect against faults that make one or more storage nodes unavailable

(see abstract; paragraph 0019-0023).

As per claim 36 Burning, III et al (2002/0035667 A1) teach the system of claim 33

wherein the storage management processes includes fault recovery processes, wherein

the fault recovery processes respond to a fault condition by communicating with at least one of the external storage nodes to make available a set of data that would otherwise be unavailable as a result of the fault condition (see paragraph 0018-0022).

Claim Rejections - 35 USC § 103

8. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over Burning, III et al (2002/0035667 A1) in view of Laursen et al (5,805,804 A).

As per claim 5 Burning, III et al (2002/0035667 A1) teach the data storage system having a private network having IP (internet capabilities) as applied to claim 1, 3 and 4 above but do not disclose wherein the private network comprises a virtual private network implemented over the Internet. However Laursen et al (5,805,804 A) disclose a virtual private network implemented over the Internet (see fig.2 and associated text). It would have been obvious to one of ordinary skilled in the art at the time the invention was made to utilize Laursen's virtual private network over internet in Burning, III et al's storage site failover capability in order to provide a distributed client-server computing and access to the data over asymmetric real-time networks.

9. **Claims 14-16 and 26-27** are rejected under 35 U.S.C. 103(a) as being unpatentable over Burning, III et al (2002/0035667 A1) in view of Dugan et al (6,779,030 B1).
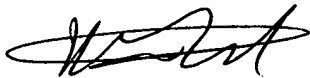
As per claims 14-16 and 26-27 Burning, III et al (2002/0035667 A1) teach the data storage system of claim 1 as applied above but do not disclose explicitly wherein the communication medium comprises a secure communication medium, implementing an authentication protocol between linked storage nodes and cryptographic security between linked storage nodes. However Dugan et al (6,779,030 B1) disclose wherein the communication medium comprises a secure communication medium (see col.64, lines 54-60), implementing an authentication protocol between linked storage nodes and cryptographic security between linked storage nodes (see col.74, lines 31-35). It would have been obvious to one of ordinary skilled in the art at the time the invention was made to utilize Dugan's secure cryptographic process in Burning, III et al's storage system in order to provide content privacy such as voice privacy (see col.74, line 33-34).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: see enclosed PTO-892.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kambiz Zand whose telephone number is (571) 272-3811. The examiner can normally reached on Monday-Thursday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Gilberto Barron can be reached on (571) 272-3799. The fax phone

numbers for the organization where this application or proceeding is assigned as

(571) 273-8300. Information regarding the status of an application may be

obtained from the Patent Application Information Retrieval (PAIR) system. Status

information for published applications may be obtained from either Private PAIR

or Public PAIR. Status information for unpublished applications is available

through Private PAIR only. For more information about the PAIR system, see

http://pair-direct.uspto.gov. Should you have questions on access to the Private

PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197

(toll-free).

Kambiz Zand

09/07/2005

AU 2132